# CLAIMS

1. A method for alternately contacting two wafer-like component composite arrangements (12, 14) consisting of a plurality of cohesively designed similar components, in particular of a semiconductor wafer with a function component wafer for manufacturing electronic modules on a wafer level, in which the two component composite arrangements, each provided with contact metallizations on their opposing contact surfaces (38, 39), are brought into a coverage position with their contact metallizations to form contact pairs, in which position the contact metallizations that are to be joined together are pressed against one another, the contact metallizations being thereby contacted by exposing the rear of one of the component composite arrangements (12) to laser radiation (20), whereby the wavelength of the laser radiation is selected as a function of the degree of absorption of the component composite arrangement exposed to laser radiation at the rear, so that transmission of the laser radiation through the component composite arrangement exposed to the laser radiation at the rear is essentially suppressed or absorption of the laser radiation takes place essentially in the contact metallizations of one or both component composite arrangements.

2. The method according to Claim 1,
characterized in that
the substrate material of the component composite arrangement (55) that is exposed to laser radiation at the rear is selected so that there is transmission of the laser radiation (20) through the component composite arrangement exposed to the laser radiation at the rear and there is absorption of the laser radiation in the contact metallizations (61) of the component composite arrangement exposed to laser radiation at the rear.

3. The method according to Claim 1,

characterized in that

the substrate material of the component composite arrangement (55) exposed to laser radiation at the rear is selected so that there is transmission of the laser radiation (20) through the component composite arrangement exposed to laser radiation at the rear and there is absorption of the laser radiation in the contact metallizations (61) of the component composite arrangement exposed to laser radiation at the rear and in the contact metallizations (67) belonging to the opposing component composite arrangement (56), these contact metallizations having a larger surface area in comparison with the contact metallizations (61) of the component composite arrangement (55) exposed to laser radiation at the rear.

4. The method according to any one of the preceding claims, characterized in that

the laser treatment is performed by means of a composite arrangement (18, 42, 47) of a plurality of diode lasers (43) which are activated individually or in groups to emit laser radiation (20) such that all the contact pairs or those combined into groups are exposed to laser radiation for the contacting.

5. The method according to any one of the preceding claims, characterized in that

the diode laser composite arrangement is designed as a diode laser linear arrangement (42) which is arranged at a distance below the component composite arrangement (12) which is exposed to laser radiation (20) at the rear, and the diode laser linear arrangement is moved in at least one axis and in parallel to the plane of extent of the component composite arrangement.

6. The method according to any one of the preceding claims, characterized in that

the diode laser composite arrangement is designed as a diode laser matrix arrangement (47), whereby the diode lasers (43) are activated in their totality or only to the extent of a partial matrix according to the size of the component composite arrangement (12) exposed to laser radiation (20) at the rear.

7. The method according to any one of the preceding claims, characterized in that

a reference temperature is measured in an intermediate space (40) formed by the distance, the measurement being performed by a transmission device (19) through which the laser radiation (20) passes.

8. The method according to any one of the preceding claims, characterized in that

for alignment of the contact metallizations in a coverage position to form the contact pairs, the component composite arrangement (14) opposite the component composite arrangement (12) exposed to laser radiation (20) at the rear is positioned by means of a positioning device (31) which acts biaxially and in parallel to the plane of extent.

9. A device for alternately contacting two wafer-like component composite arrangements (12, 14) consisting of a plurality of cohesively designed identical components, in particular of a semiconductor wafer having a function component wafer for manufacturing electronic modules by a method according to any one of Claims 1 through 8, having a receiving frame (11) for supporting and holding the first component composite arrangement (12) on a transparent panel (17) arranged in the receiving frame, having a diode laser composite arrangement (18, 42, 47) arranged inside the receiving frame and separated from the component composite arrangement (12) by the transparent panel, having a holding clamp (13) for receiving the second component composite arrangement (14) such that contact surfaces (38, 39) of the component composite

arrangements provided with contact metallizations are arranged opposite one another, having a positioning device (31) for relative positioning of the component composite arrangements such that the contact metallizations to be joined together form contact pairs, and having a pressure device (31) for generating a contact pressure between the contact metallizations of the contact pairs.

10. The device according to Claim 9,
characterized in that
the diode laser composite arrangement is designed as a diode laser linear arrangement (42) having a plurality of diode lasers (43) arranged in a row which diode lasers are arranged on a diode laser mount that can be moved across the alignment of the row and in parallel to the plane of extent of the component composite arrangement (12).

11. The device according to Claim 10,
characterized in that
the diode lasers (43) of the diode laser linear arrangement (42) can be activated individually or in groups in such a way that only the diode lasers of the diode laser linear arrangement which are needed for coverage of the respective transverse extent of the contact surface of the component composite arrangement as a function of the distance (46) to be traversed can be activated for acting upon a circular contact surface (38) of the component composite arrangement (12) with the diode laser linear arrangement that can be moved in parallel to the plane of extent of the component composite arrangement.

12. The device according to Claim 11,
characterized in that
the diode laser composite arrangement is designed as a diode laser matrix arrangement (47) having a plurality of diode lasers (43) each arranged in rows and columns.

13. The device according to Claim 12, characterized in that the diode lasers (43) of the diode laser matrix arrangement (47) can be activated individually or in groups such that with a coaxial alignment of the surface midpoints of the contact surface (38) of the component composite arrangement (12) and of the matrix surface for acting upon the circular contact surface, the diode lasers can be activated according to the size of the contact surface either in a totality or only to the extent of a partial matrix required for coverage of the contact surface.

14. The device according to any one of Claims 9 through 13, characterized in that a transmission device (19) which serves to measure a reference temperature is provided in an intermediate space formed by a distance between the transparent panel (17) and the diode laser composite arrangement (18, 42, 47).

15. The device according to any one of Claims 9 through 14, characterized in that for alignment of the contact metallizations in a coverage position to form the contact pairs, the component composite arrangement (14) opposite the component composite arrangement (12) that is exposed to laser radiation at the rear is arranged in a positioning device (31) that can be moved in at least two axes.

16. The device according to Claim 15, characterized in that the positioning device (31) is designed to be triaxial such that in addition to a biaxial positioning of the component composite arrangement (14) in the plane of extent of the component composite

arrangement, the positioning device serves to execute an adjusting movement across the plane of extent such that the positioning device serves to create the contact pressure.

17. A component composite (58) comprised of two wafer-like component composite arrangements (55, 56) to be contacted alternately according to any one of Claims 1 through 8 with a first transparent component composite arrangement (55) comprised of a plurality of cohesively designed transparent cover elements (59) and a second component composite arrangement (56) comprised of a plurality of cohesively designed sensor units (64) each having at least one sensor (71) each of which is brought into contact with a substrate unit of a sensor unit which is equipped with through-contacts (72) for rear contact access (73) to the sensor unit (64).

18. The component composite according to Claim 17,
characterized in that
the oppositely arranged contact metallizations (61, 67) of the cover units (55) and the sensor units (56) that are brought into contact with one another have a solder material as the contact material (62, 68).

19. The component composite according to Claim 17,
characterized in that
of the group of contact metallizations (61) assigned to the cover units (56) and the group of contact metallizations (67) assigned to the sensor units (64), at least one group has a conducting adhesive as the contact material (62, 68).

20. The component composite according to any one of Claims 17 through 19,
characterized in that
at least one group of contact metallizations (61, 67) has an

absorption layer (63, 69) consisting of a highly absorbent material as the substrate for the contact material (62, 68).

21. The component composite according to Claim 20,

characterized in that

an adhesion promoting layer is provided between the absorption layer (63, 69) and the contact material (62, 68).

22. The component composite according to Claim 20 or 21,

characterized in that

the absorption layer (69) of the group of contact metallizations (67) assigned to the sensor units (64) has an enlarged surface area in comparison with the contact metallizations (61) of the cover units (59).

23. The component composite according to any one of the preceding Claims 17 through 22,

characterized in that

a contact metallization (61) of the cover units (59) surrounding a sensor (71) in a ring is brought into contact with a contact metallization (67) of the respective sensor unit (64) surrounding the sensor in a ring, thereby forming a sealing ring.